REMARKS

In the Office Action, claims 1-2, 9 and 15 are rejected under 35 U.S.C. §102(b) as being anticipated by Tabuchi, claims 1-2 and 11-14 are rejected under 35 U.S.C. §102(b) as being anticipated by Tu, claims 3-8 and 10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Tabuchi, and claims 15-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Tu.

The gist of the instant invention is to provide a bi-directional transceiver that is capable of processing multiple wavelengths. A silicon wafer is used as a substrate on which a groove is etched for transmission paths of optical signals. At least an optical lens, an optical fiber and a thin film filter are disposed on the substrate to separate and guide input optical signals to a signal detector and output signals from a laser diode. The groove is etched in such a way that the optical transmission paths after being split by the thin film filter have two separate transmission paths perpendicular to each other within the groove for the input optical signals and the output optical signals respectively. A slanted bottom surface of the groove is formed near the signal detector which is positioned above the groove and has a receiving surface facing the slanted bottom surface. The input optical signals are reflected upward by the slanted bottom surface to the signal detector along an optical transmission path perpendicular to the two optical transmission paths in the groove.

Tabuchi discloses a hybrid type integrated optical device having a double-layered substrate. Optical components are disposed in grooves formed on the substrate for easy

alignment on an optical axis. As can be seen in the specification of Tabuchi, a cube type half mirror 18 is surrounded by four spherical lenses 16a-d to construct the hybrid optical device (FIG. 2; col. 7, lines 14-25). **It should be noted that Tabuchi does not teach or suggest using a *thin film filter* which is an essential component of the instant invention and different from the cube type half mirror. The optical transmission paths and slanted bottom surface formed in the groove of the instant invention are neither described nor anticipated by the art of Tabuchi.**

Tu teaches a wavelength division multiplexing transmitter and receiver module using a micromachined silicon substrate for mounting optical components. In the disclosure of Tu, the grooves formed on **the substrate are coated with thin dielectric films** to form dielectric multi-layered filter 303 and dielectric multi-layered half-mirror 304 for splitting and reflecting lights to the two receivers 311 and 310 (FIG. 3; col. 3, lines 43-52). Applicants respectfully contend that Tu's art can not be practiced because even with today's most advanced technology, **coating a thin film on a silicon substrate** can only create a total reflection thin film. Furthermore, the main figure (FIG. 3) of Tu's disclosure is contradictory and inconsistent. In the figure, optical signals travel through the air and the substrate along an optical path of a same optical axis which obviously violates the Snell's law in optics. Refraction due to the different media (air and substrate) would certainly change the optical path shown in FIG. 3 and make Tu's device non-functional. More importantly, **Tu never teaches etching a groove in such a way that the optical transmission paths after being split by the thin film filter have two separate transmission paths perpendicular to each other within the groove for the**

input optical signals and the output optical signals respectively. The input optical signals reflected upward by the slanted bottom surface to the signal detector *along an optical transmission path perpendicular to the two optical transmission paths* is not taught by Tu either.

In response to the office action, claim 1 amended to more particularly claim the subject matter of the present invention in a patentable way to overcome the rejections under 35 U.S.C. §102(b) and §103(a). In particular, claim 1 now specifically includes the optical paths split within the groove by the thin film filter and directed by the slanted bottom surface upward to the signal detector. As discussed above, none of the cited prior arts have taught or suggested such limitations. The amended claim 1 should be allowable. By virtue of dependency, claims 2-10 and 13-18 should also be allowable. Claims 11 and 12 are cancelled.

From the foregoing discussion, it is clear that the instant invention differs from the cited prior arts. The physical difference results in different effects and is not obvious. Claims 1-10 and 13-18 are in full condition for allowance. Prompt and favorable reconsideration of the application is respectfully solicited.

Respectfully submitted,

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